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UTAH STATE UNIVERSITY
DEPARTMENT OF FAMILY & HUMAN DEVELOPMENT
UMC 29
LOGAN, UTAH 84322

PROXEMIC BEHAVIORS OF SOCIOMETRICALLY IDENTIFIED
PRESCHOOL CHILDREN

by

Laura Gaynard

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Family and Human Development

UTAH STATE UNIVERSITY
DEPARTMENT OF FAMILY & HUMAN DEVELOPMENT
UMC 29
LOGAN, UTAH 84322

DEDICATION

This project is lovingly dedicated to Bruce Kranzberg. Without his continuing support, encouragement, and concern I would have never commenced, much less completed, my graduate study.

ACKNOWLEDGMENTS

Many people have contributed a great deal to the completion of this project. I'd like to take this opportunity to express my gratitude to some of them: J. Craig Peery for support and guidance that taught me to stretch my limits and test my capacities; the faculty of Family and Human Development, for their encouragement and concern; Don Carter and Elaine Ashcroft for their special interest in me and my career; Jock Little, Barbara Kirks, Scott and Cheryl Wright, and Mindy Toney for never-ending moral support and encouragement; and my parents, Mr. and Mrs. C. C. Gaynard for 27 years of faithful guidance and loving direction. I am indebted to you all.

Laura Gaynard

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ABSTRACT

Proxemic Behaviors of Sociometrically Identified
Preschool Children

by

Laura Gaynard, Master of Science

Utah State University, 1980

Major Professor: Dr. J. Craig Peery
Department: Family and Human Development

From a population of 160 children, 59 were sociometrically identified into four categories: popular, amiable, isolated, and rejected. Same-sexed pairs of children were then observed in an experimental play situation in which two experimenters, using a computerized event recorder, obtained the amount of time each identified child spent at various distances (0-305 cm) from the confederate. Frequency of moves was also recorded. A general pattern of proxemic behavior for all children, across category, was found to exist in which subjects spent the majority of time at distances of 30.5 cm to 122 cm and very little time at greater distances. Analyses of the data also produced differences in proxemic behavior between categories: the popular children spent the majority of their session time close to the confederates (0 to 91.5 cm), and very little time at greater distances. The rejected children made attempts to maintain close distances to their peers but were rejected by the other children which led to a large

proportion of time being spent further away from the confederates (152.5 to 305 cm). The amiable children spent the majority of their time at intermediate distances of 31.5 to 244 cm and the isolated children maintained the longest durations of time at the greatest distances for all four categories. These findings were discussed in relation to Hall's¹ theory of adult personal space zones.

¹E. T. Hall, The Silent Dimension, New York: Doubleday, 1966.

INTRODUCTION

Previous research indicates that preschoolers are differentiated in terms of the extent to which they are acceptable to others (Koch, 1933; Moreno, 1942; Northway, 1943; Dunnington, 1957; Hartup, Glazer & Charlesworth, 1966; Moore, 1967), and suggests that there is considerable consistency in a child's degree of acceptability (Biehler, 1954; Marshall & McCandless, 1957). The social strata that results from preschoolers' social behavior exerts a strong influence on the future of each child because much of a child's adjustment in a group depends on the degree to which others find him acceptable (Lippett, 1941; Garvey, 1973; Ladd & Oden, 1977). Peer relations have important predictive consequences in terms of later social adjustment and mental health (Moore, 1967; O'Connor, 1969). Understanding will lead to the specification of certain peer-relation factors which possibly account for differences in social identification (Moreno, 1942; Northway, 1942; Moore, 1967; O'Connor, 1969; Garvey, 1973; Gottman, Gonso & Rasmussen, 1975; Gottman, 1977).

Studies of popularity and its opposites, rejection (and isolation), among children, suggest that nonverbal behavior affects the degree to which children are accepted or rejected by their peers, and is central to the establishment and maintenance of relationships among peers (Scherer, 1974; Gottman, Gonso, & Rasmussen, 1975; Argyle & Cook, 1976; Schaeffer & Higgins, 1976). To date there is insufficient understanding as to the specific nonverbal behavior

characteristics of young children who receive high or low status in the earliest stable peer group experience (Beaver, 1932; Dunnington, 1957; McMahan, 1976).

Sociometric Identification

A picture sociometric technique for use with preschool children has evolved in which each child in a preschool class is shown pictures of his classmates and asked to identify both positive and negative social preferences, e.g., Who do you most play with? Who don't you play with? etc. (Dunnington, 1957, Marshall & McCandless, 1957; Peery, 1979). Recently, Peery (1979) has reconceptualized the scoring for this technique dividing sociometric outcomes into four categories of popular, rejected, amiable and isolated, rather than the usual two (popular and rejected). These categories are determined using two scoring dimensions: Social impact is the number of times a child is mentioned by his classmates on the sociometric questionnaire. Social preference is the number of times a child is mentioned negatively subtracted from the number of times he is mentioned positively. Popular sociometric status refers to children who receive high social impact and scores and positive social preference ratings. The rejected child receives attention from his peers (high social impact) but has a negative social preference score. The isolated child has low social impact scores and negative social preference scores. The amiable child is designated as having a low social impact rating but receives positive social preference scores. Identifying children in each of these categories is efficiently accomplished by administering this picture sociometric technique.

Behavior Correlates of Sociometric Status

The social processes involved in the variable ability of individuals to establish and maintain peer relations is a complex phenomenon that includes both the verbal and nonverbal modes of communication (Altman, 1975; Gottman, Gonso, & Rasmussen, 1975).

While both areas offer interesting avenues of research, this study is concerned with the relationship between nonverbal behavior and children's sociometric status.

Nonverbal communication has been defined as the exchange of information through nonlinguistic signs (Harrison, 1974), and has its beginnings in the first days of life (Condon & Saunders, 1973; Peery, In Press). By two years of age the child is capable of communicating nearly a dozen different emotions with his body alone (Bridges, 1933). The fact that the nonverbal system of communication precedes the verbal mode, leads many to consider the possibility that body motion is more important than verbal communication for certain kinds of interaction (Wood, 1976).

Of particular concern in the study of nonverbal communication is proxemic behavior. Hall (1966) coined the term proxemics to define those nonverbal communicative acts which are used to structure personal space.

Proxemics and Personal Space

Personal space deals directly with the area that surrounds an individual. Ethologists have carefully studied personal space in animals by observing their habits in natural settings. Through these

investigations, and recent observations of human behavior, it is obvious that the proxemic behavior of the latter differs markedly from that of other animals (Evans & Howard, 1973; Altman, 1975). Hall (1966) likens the personal space behavior to "bubbles" or zones which are controlled by each individual's assessment of the immediate situation and impending interaction. Hall has conceptualized four regions of personal space: (a) the intimate zone, which is reserved for very personal relationships extends from zero to 46 cm, (0 to 1.5 ft.) away from the individual; (b) the personal zone extends 46 cm to 122 cm (1.5 to 4 ft.) from the person and is reserved for contacts with people of a friendly nature; (c) the social zone encompasses the area 122 cm to 365 cm (4 to 12 ft.) from the individual and is reserved for business and general social contacts; (d) the public zone is typically used for formal occasions including meetings, public speakers, or interaction with high status persons, and encompasses the 365 cm to 730 cm (12 to 24 ft.) distance around a person. Each of these zones is used to avoid inappropriate intrusions upon others and to regulate interaction between people. Thus, personal space operates as a buffer mediated by a series of behaviors that check whether an approacher should be encouraged in his approach or discouraged from coming further (Crane, Note 1).

Proxemic Behavior as a Function of Sociometric Status

According to Argyle and Cook (1976) social behavior consists of interaction sequences in which each interactor is aware of his part. There also exists a close coordination of the moves by each involved

member. Thus, in order to initiate a social encounter a number of distinctive nonverbal moves have to be made. These usually include approaching nearer to the other, changing orientation, and looking at him to see if the proposed encounter is acceptable (feedback). In this two-way interaction, each person is independently pursuing his own social goals, responding to feedback from other interactants. Argyle and Cook (1976), suggest a stimulus-response, social-skill model that conceptualizes such interaction as a persistent production of related responses which are evoked by feedback obtained from others in the interactional situation. The normal social process may thus be depicted as a cyclical event in which responses of one interactant are dependent on the feedback or the social initiation (stimulus) of another participant.

Bakken's research (Note 2) correlating proxemic behavior and sociometric status becomes interesting when interpreted in light of Argyle and Cook's stimulus-response, social-skill model. Bakken's data showed amiable and isolated children spending more time at greater distances from their peers which created larger personal space distances between subjects and limited the amount of close interaction possible. The popular children spent more time physically close to their peers which maximized their close personal exchanges. Hence, the amiable and isolated children not only seem to spend less time interacting at close distances, thus experiencing fewer social encounters, but according to Argyle and Cook (1976), they should theoretically also emit nonverbal feedback that discourages social initiation from others. This would further limit their

social contact (impact), thus affecting their sociometric status. Just the opposite situation appears to be taking place with the popular and the rejected children. These children initiate contact within their smaller personal space zones and maintain a high degree of physical contact, thereby facilitating social exchange with others.

In light of Bakken's data, a nonverbal interactional feedback system seems to be operating within the preschool social strata, which is directly related in some manner to various sociometric statuses of children. If preschoolers have established personal space boundaries, as has been suggested, and indicated previously (Eberts & Lepper, 1975; Hall, 1966; Crane, Note 1; Bakken, Note 2), proxemics might provide valuable insight into the behavioral differences between children of different sociometric status.

Observation of Proxemic Behavior

Previous research on proxemics in children frequently asked the children verbally to identify zones (distances) with cards, paper figures, or stories (Hamid, 1974; Scott, 1974; Melson, 1976). The determination of whether children are unaware of personal space mechanisms or are simply unable verbally to respond has created ambiguity. This has resulted in a controversy as to whether preschoolers have developed stable proxemic behaviors. In vivo observations of children's proxemic behavior leads to evidence that personal space zones are truly developed at the preschool level. Where behavioral observations have been employed with preschoolers,

personal space has been manifest (Eberts & Lepper, 1975; Crane, Note 1; Bakken, Note 2).

Play Behavior

Play constitutes a major part of a preschooler's life. It is relevant to the study of proxemic behavior due to the private schedules and boundaries for entry and exit of play that exist among individual children (Sutton-Smith, 1967). There is a difference in the ease with which individuals can initiate and integrate play encounters which may be directly influenced by relevant psychological functions (Sutton-Smith, 1967). Thus, play is thought to be influenced by personal space boundaries and also various psychological social variables. This knowledge increases the relationship between children's sociometric status and proxemic behavior as expressed through play.

Previous observational studies of children's play indicate that the presence of more than one type of play stimulus in an experimental condition results in toy effects that are confounding to the results obtained (Bakken, Note 2). Attractiveness of various toys has differential effects on subjects that may increase or decrease the amount of time children may remain in proximity to a particular toy, regardless of that child's peer status. Hence the only play stimulus used in this study was play dough. This play material allowed the children to manipulate the play style as they desired: Whether a child wished to remain in solitary play or join with another child was entirely his/her own choice. This type of medium was also conducive to all styles of play and did not force any specific

situation. It was also anticipated that the play dough would cause the children to remain at the table which would make it easier to measure interpersonal distance.

Summary

Previous study has indicated that the nonverbal communication system includes behaviors affecting the various sociometric ratings received by children (Sutton-Smith, 1967; Evans & Howard, 1973; Altman, 1975; Bakken, Note 2). This study examined the proxemic behavior of sociometrically identified preschool children in a dyadic play situation. The children were sociometrically identified into one of five categories, (popular, rejected, isolated, amiable, and nonidentified), and their personal space behavior, in a play setting, observed to determine if differences in sociometric status are manifested in varying types of proxemic behavior. The play setting imposed situational constraints on the children's play behavior, allowing their personal space characteristics to be fully functional.

METHOD

Subjects

A total of 160 children (80 female, 80 male) from 8 classes of 20 students each from Child Development Laboratories were employed as subjects for the sociometric identification. Fifty-Nine sociometrically identified children and 59 nonidentified children were observed together in a dyadic play situation. Ages of the children ranged from 3-5 to 5-0 years of age, mean age for each identified category was as follows: popular, 50 months; amiable, 49 months; isolated, 51 months; rejected, 50 months. The sample identified by the sociometric measure yielded the following sex distribution: popular, 8 females, 7 males; amiable, 9 females, 5 males; isolated, 6 females, 8 males; rejected, 8 females, 8 males. Subjects were predominantly middle-class Caucasians from communities surrounding the university.

Identifying Measures

Target children in each sociometric category were identified using the sociometric picture technique (Peery, 1979). Four weeks after the preschool class had begun, a picture board containing a 3 x 3 inch photograph of each child in a particular lab school classroom was set up in the room for the week immediately preceding the sociometric testing. At the beginning of the fifth week children were individually asked to point to the picture and/or name a child,

in response to the following questions, which were counterbalanced to avoid ordering effect:

1. Whom do you like to play outside with?
2. Whom do you like to sit next to for stories on the rug?
3. When you can do whatever you want to, whom do you like to do it with?

Then the negative questions were asked:

4. Whom don't you play with outside?
5. Whom don't you sit next to for stories on the rug?
6. When you can do whatever you want whom don't you play with?

Unless the child volunteered two names, the experimenter asked, "Who else?" until two names were obtained.

Social impact of each child was determined by the number of times a child was mentioned by his classmates on the sociometric questionnaire (positively or negatively). Social preference was the number of times a child was mentioned negatively, subtracted from the number of times a child was mentioned positively. The children's social impact and social preference scores were then plotted on intersecting axes (Figure 1). Those children who were closest to the limits of the maximum choice space were then identified in each quadrant. The 59 nonidentified subjects were selected from the population of children that were not identified as popular, amiable, isolated, or rejected.

Procedure

The research laboratory of the Department of Family and Human Development was utilized for the observation of the subjects. This

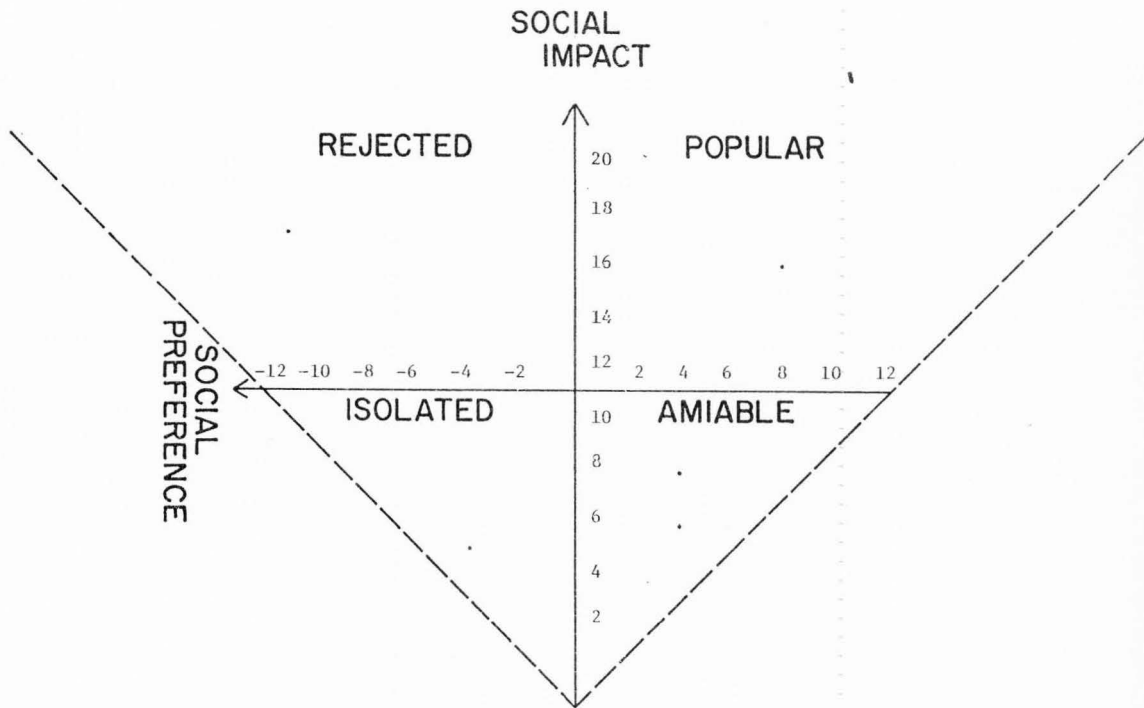


Figure 1. Intersecting axes for plotting sociometric status.

room is especially designed for observation procedures behind one way mirrors, and measures 13.7 m x 13.9 m. The only objects in the room were a child-sized table 340 cm long placed flush against one wall on a piece of plastic that extended 61 cm (2 ft.) out from one side of the table. There were also 10 balls of green colored play dough placed at 30.5 cm (1 ft.) intervals on top of the table. Masking tape markers, 2.54 cm (1 inch) long were placed on the wall at 30.5 cm intervals to facilitate scoring the child's position. A binary code for each of 30.5 cm zones was taped to the wall above the table (Figure 2). The zones consisted of the 10, 30.5 cm distances along the table, and one "off-task" zone. This last zone included the area extending 61 cm (2 ft.) or greater from the table. The children were free to move about anywhere in the room during the observation period.

Two children of the same sex were brought to the research lab for a ten minute observation period. One child was from the identified sample of target children. The other child was from the nonidentified group of children.

The experimenter brought the children into the research lab with the instructions: "I'd like you to play with any of the balls of play dough on the table, and make whatever you want. I'll be back in a few minutes to take you back to class." The experimenter left the room and the observation commenced for the ten minute period.

Data Collection

To measure the interactional proxemics of the children, the location of each child was continuously recorded. Two trained

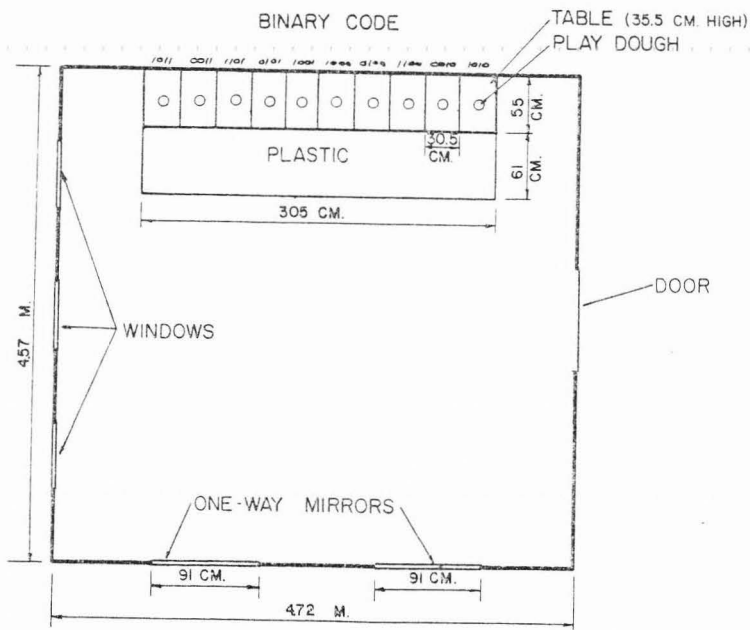


Figure 2. Research Laboratory, Department of Family and Human Development, Utah State University.

observers recorded the location and change of location of the children. These observers achieved an inter-rater reliability for duration of time in each location of 96.1%. The mean time for errors in duration was 1.19 seconds. The location inter-rater reliability for the two observers was 100%. These scores were obtained by having both observers simultaneously score one child's movements and durations of time spent in each location.

During the ten minute observation period, one observer watched the nonidentified child and the second observer scored the child from the identified sample. Switches were connected to an especially designed multiplexor, integrated with a computer, that recorded the frequency and duration for each child in each zone. The following data were then stored for later analysis of total session time, total time at each distance apart, median time at each distance apart, mean time at each distance apart, and frequency of moves to each distance.

The observers manipulated four switches each to correspond with the binary numbers placed above each zone on the wall behind the table in the observation room, to record the children's movements from one distance to another (Figure 2). This allowed the multiplexor to continuously monitor the incidence and duration of the various configurations of switches. When a child was off-task, the switches for that particular child were placed in an off position.

Data Analysis

The data were analyzed in terms of two situations: (a) How long did the children remain at different distances? (b) Where did the children choose to move? This analysis concerns the following decisions made by each child: "Given that I have decided to stay here how long do I stay?" and, "Given that I have decided to move, where do I go from here?" Peery (Note 3) conceptualized these decisions by means of a diagram (Figure 3). When a child is in a certain location he can decide to remain there or to move to another location. Analysis in terms of these two situations indicated which distances were most sought out by the various sociometric categories of children. It also revealed the duration of time spent at each distance for each category.

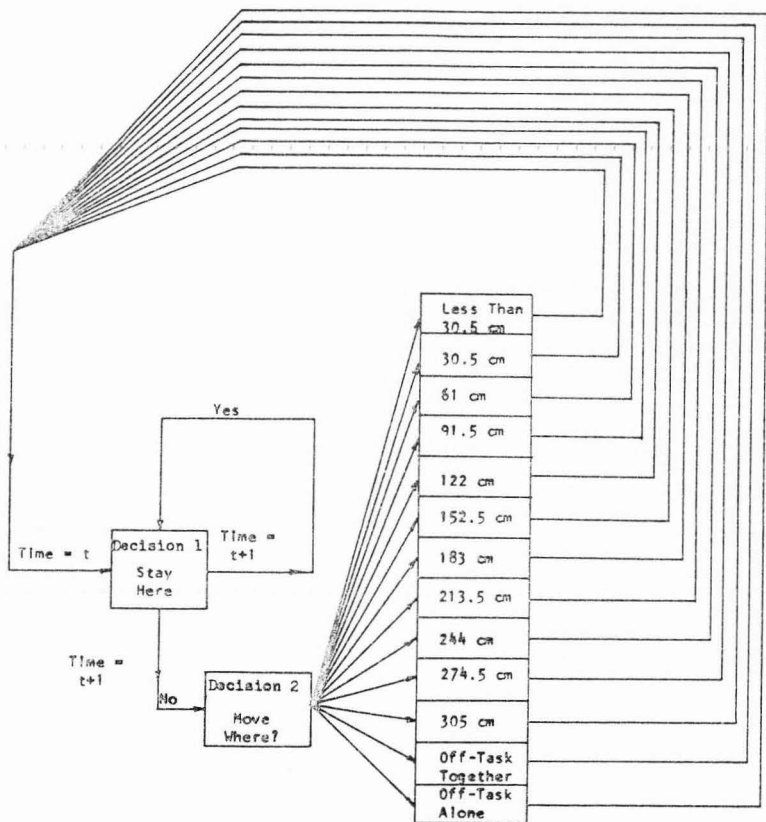


Figure 3. Analysis in terms of two decisions made by each child.

RESULTS

Similar proxemic patterns for all children observed, regardless of category, were found to exist. The proxemic behavior of children from different sociometric status were also found to differ substantially.

Interpersonal Distance

Mean proportion of time spent at each distance. Twelve analysis of variance tests run on the mean proportion of time spent at each distance for all four categories produced statistically non-significant results (see Table 1 for results at each distance). The lack of significance was due to large standard deviations for each category, and the fact that after the 152.5 cm (5 ft.) distance, the number of zeros per cell increases substantially enough to affect the strength of the anova statistic. Figure 4 illustrates the mean proportion of time spent at each distance, zero to ten feet apart. It is obvious from this distribution that although statistical significance was not found, that behavioral differences between the four categories of sociometrically identified children do exist. The greatest differences occur at the less than 30.5 cm (1 ft.), the 152.5 cm (5 ft.) and the 244 cm (8 ft.) distances, (all of which produced statistically significant results with the Kruskal-Wallis statistic).

Table 1

Mean Percent of Time Spent at Each Distance Per Category

Distance		Popular	Amiable	Isolated	Rejected	F	p<
Less than 30.5 cm	\bar{X}	5.53	1.00	2.29	1.41	1.37	.26
	SD	10.74	2.29	7.42	3.04		
30.5 cm Apart	\bar{X}	47.93	34.18	33.07	32.63	.76	.52
	SD	32.86	31.84	30.21	34.74		
61 cm Apart	\bar{X}	25.13	30.71	37.93	28.50	.84	.48
	SD	17.90	25.17	18.83	26.30		
91.5 cm Apart	\bar{X}	16.13	16.25	14.68	22.06	.30	.83
	SD	22.67	24.99	21.02	25.39		
122 cm Apart	\bar{X}	3.00	4.39	5.07	8.66	.65	.59
	SD	4.93	8.97	10.21	18.19		
152.5 cm Apart	\bar{X}	.33	10.43	3.07	1.47	1.99	.13
	SD	.49	23.64	7.67	3.21		
183 cm Apart	\bar{X}	.47	1.29	1.32	.63	.72	.55
	SD	.64	2.40	2.66	1.78		
213.5 cm Apart	\bar{X}	.53	1.29	.61	2.50	.96	.42
	SD	1.55	3.99	1.15	5.63		
244 cm Apart	\bar{X}	6.63	0.00	1.28	.11	.90	.45
	SD	25.33	0.00	4.21	.29		
274.5 cm Apart	\bar{X}	.13	.29	.38	.21	.18	.91
	SD	.52	.83	.50	.58		
305 cm Apart	\bar{X}	.25	.07	4.29	.50	1.08	.37
	SD	.80	.26	14.92	1.41		

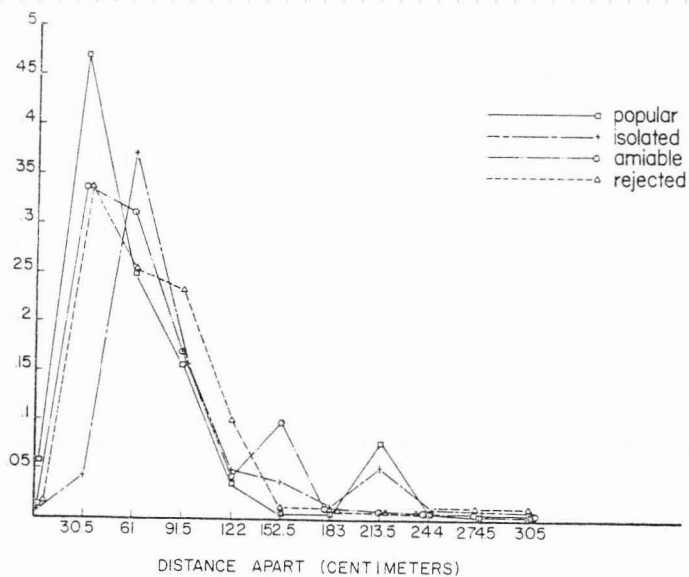


Figure 4. Mean proportion of time spent at each distance.

The distribution depicted in Figure 4 also illustrates the lack of normality in the distribution of this data, which further decreased the strength of the analysis of variance statistic. This distribution illustrates a general proxemic pattern of preschool children who spend the greatest proportion of time in the 30.5 cm to 152.5 cm (1 to 5 ft.) distances, with much less time being spent in the less than 30.5 cm distance, and those distances greater than 152.5 cm; popular children spent 92.5% of their time 30.5 to 122 cm (1 to 4 ft.) apart; amiable children spent 79% of their time at this distance apart; isolated children spent 88% of their total time 30.5 to 122 cm (1 to 4 ft.) apart; rejected children spent 84.05% of total session time at these close distances to their confederates.

Time spent separated by different distances. For comparability across sessions, normalized relative frequency distributions were plotted for the distances of less than 30.5 cm (1 ft.) to 305 cm (10 ft.) (Figures 5 through 15). This allowed comparison of the frequency distributions for each distance for all four categories. Distributions for the less than 30.5 cm to 305 cm distances reveal general proxemic similarities for all children, regardless of sociometric category.

All of the eleven frequency distributions are skewed, to some degree, to the left, demonstrating many more interactions in the less than 30.5 cm to 122 cm (0 to 4 ft.) distances than in the 152.5 cm (5 ft.) to 305 cm (10 ft.) distances for all four categories of observed children.

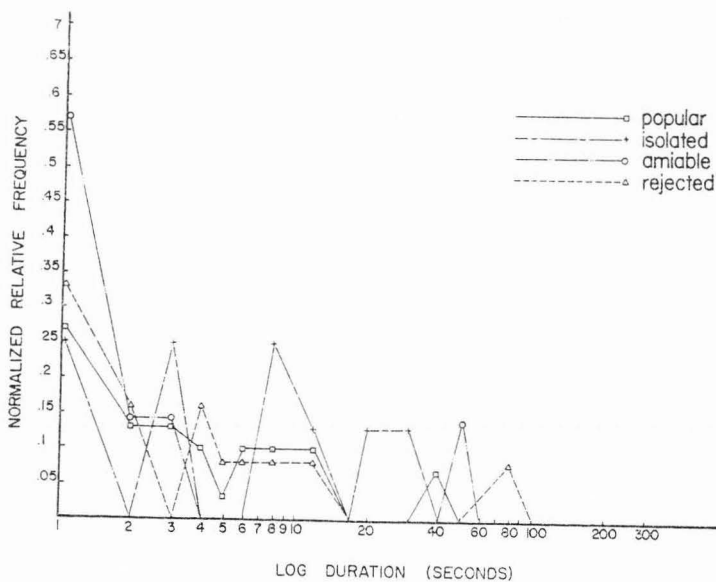


Figure 5. Normalized relative frequency distribution when less than 30.5 centimeters apart.

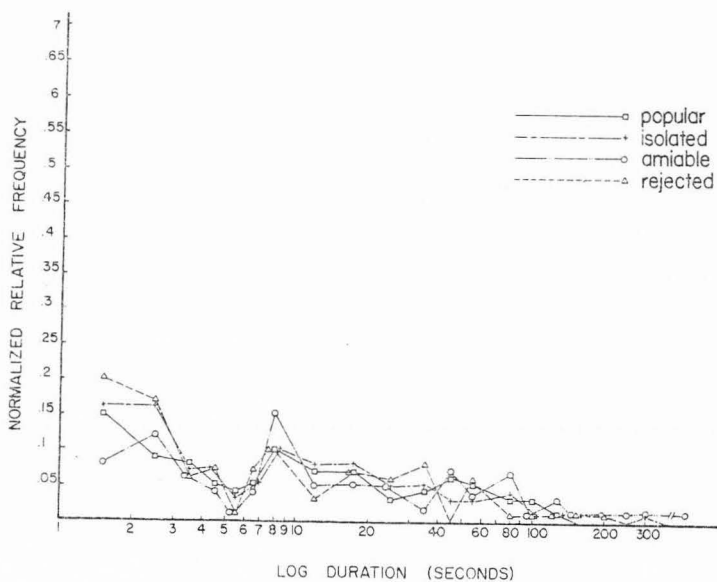


Figure 6. Normalized relative frequency distribution when 30.5 centimeters apart.

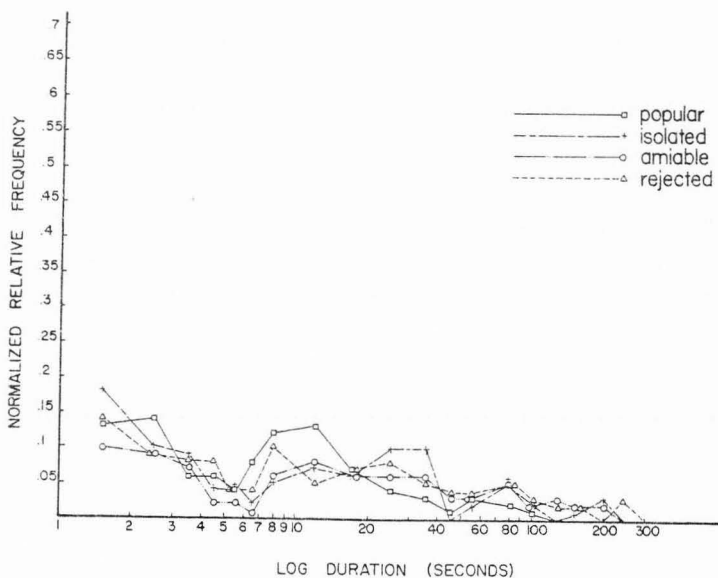


Figure 7. Normalized relative frequency distribution when 61 centimeters apart.

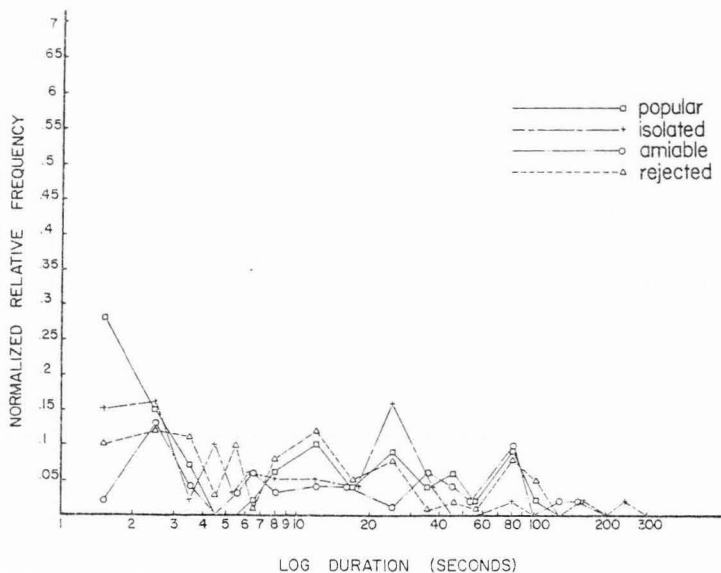


Figure 8. Normalized relative frequency distribution when 91.5 centimeters apart.

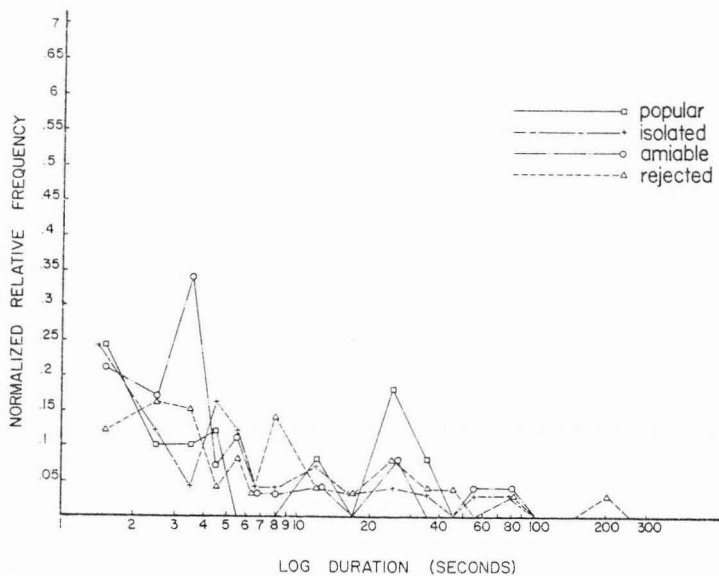


Figure 9. Normalized relative frequency distribution when 122 centimeters apart.

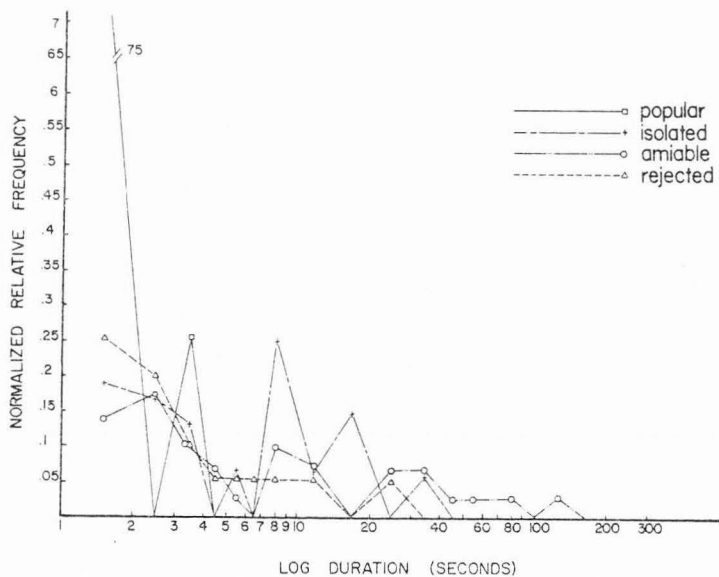


Figure 10. Normalized relative frequency distribution when 152.5 centimeters apart.

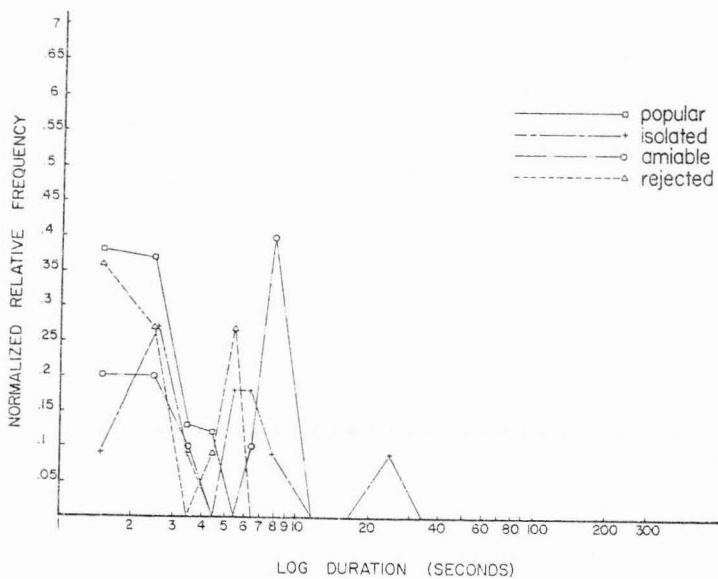


Figure 11. Normalized relative frequency distribution when 183 centimeters apart.

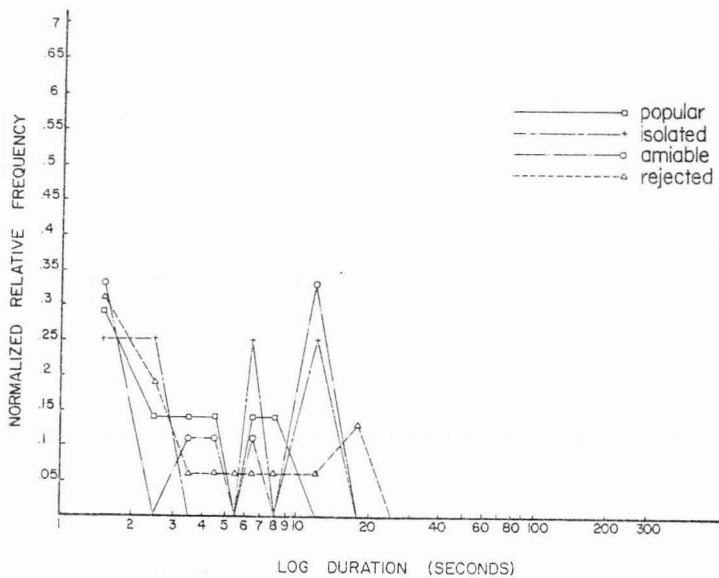


Figure 12. Normalized relative frequency distribution when 213.5 centimeters apart.

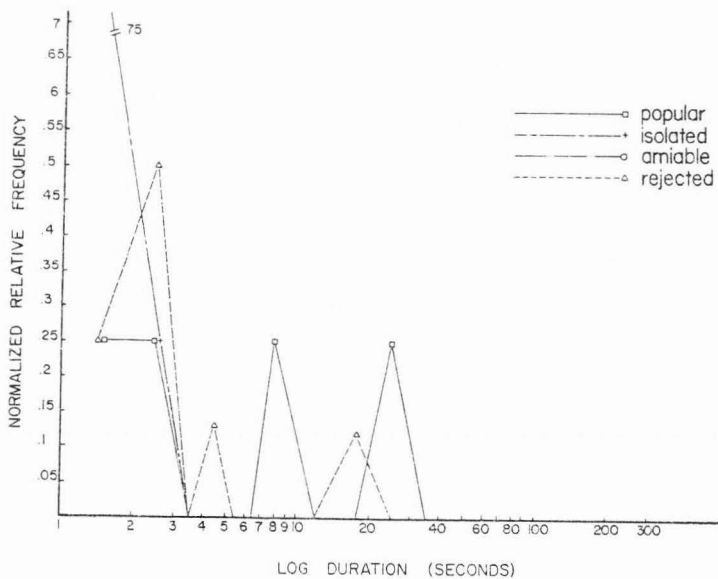


Figure 13. Normalized relative frequency distribution when 244 centimeters apart.

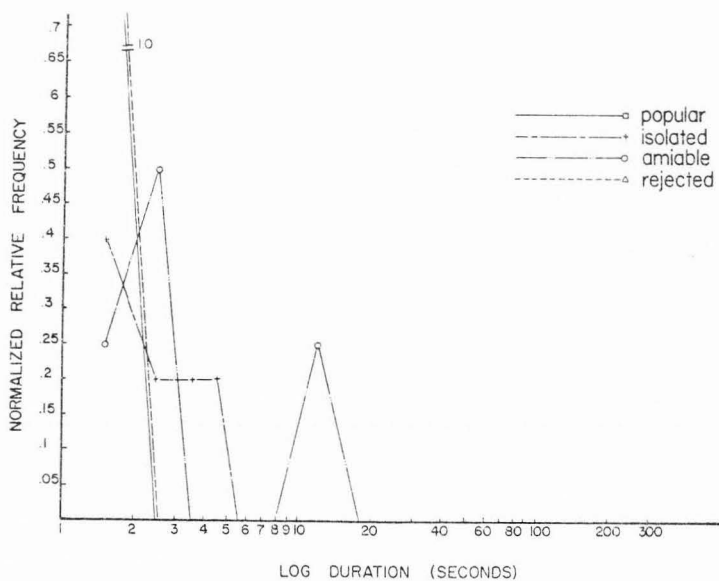


Figure 14. Normalized relative frequency distribution when 274.5 centimeters apart.

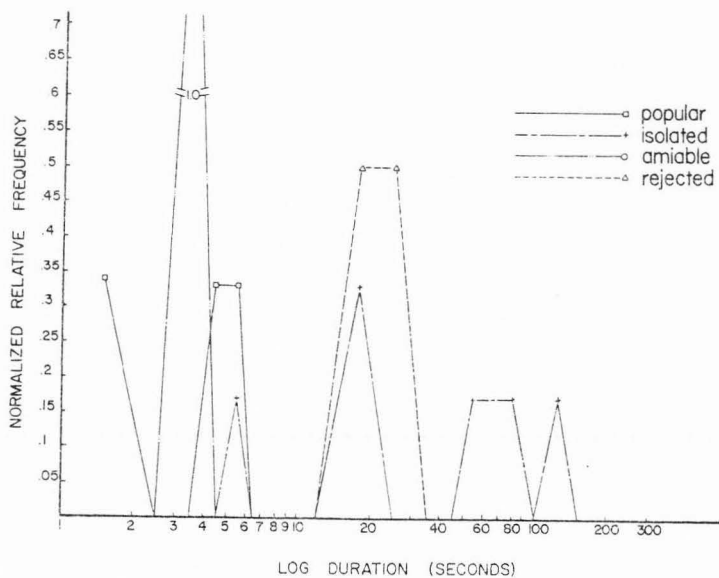


Figure 15. Normalized relative frequency distribution when 305 centimeters apart.

Examination of the eleven frequency distributions reveals that as the distances increase between the dyads, the tails of the distributions shorten, indicating less time spent at distances greater than 152.5 cm (5 ft.). Comparison of the distributions at the distances of 30.5 cm, (1 ft.), 61 cm (2 ft.), and 91.5 cm (3 ft.) demonstrates similarities for all categories of children. Regardless of the sociometric status of the subjects, they all spent a greater amount of long durations in these distances as compared to the time spent at 122 cm or greater, (4 ft. or greater). All categories of children exhibited behavior of 50 seconds and longer in the 0 to 91.5 cm (0 to 3 ft.) distances. However, when 122 cm (4 ft.) or further from their peers, the amount of durations 30 seconds or longer, continually decrease for all categories.

Differences in proxemic behavior as a function of sociometric status. The Kruskal-Wallis one-way analysis of variance by ranks was utilized to analyze the differences in duration times among the identified categories of children. The Kruskal-Wallis statistic was selected to analyze the differences between categories in time spent at various distances due to the presence of many more short than long durations. The Kruskal-Wallis compared the shapes of frequency distributions to detect differences between the sociometric categories. This statistic uses an "H" value with a chi-square distribution ($df = K - 1$), and has a power efficiency of 95.5% when compared to "F" test (Ferguson, 1976).

Table 2 presents the results for the Kruskal-Wallis one-way analysis of variance for less than 30.5 cm (1 ft.) to 305 cm (10 ft.) distances and for off-task alone, and off-task together with the confederate. The off-task zone represents any time either child moved more than 61 cm (2 ft.) away from the table on which the play dough was situated. The means and standard deviations of time spent at each distance for all four categories are also presented in Table 2.

Statistically significant differences were found in four of the twelve distances; less than 30.5 cm (1 ft.) apart, ($p < .04$); 152.5 cm (5 ft.) apart ($p < .000$); 244 cm (8 ft.) apart, ($p < .01$); target child off-task alone ($p < .04$).

Mean proportion of transitions for each category. Previous analysis of this data has focused on the child's question: Given that I have decided to stay at this distance, how long before I move? This question concerns the amount of time that a child remains at a specific distance from the nonidentified child. Separate from this decision is the question of frequency, or transitions: How many times does a child move a particular distance from the confederate? Figure 16 illustrates the mean proportion of transitions for each category in the zero to 305 cm (0 to 10 ft.) distances. Once again, the distribution is greatly skewed to the left with the greatest percentage of transitions occurring in the 30.5 to 122 cm (1 to 4 ft.) distances. The greatest amount of discrepancy is found at the following distances: 0 to 30.5 cm (0 to 1 ft.); 152.5 cm (5 ft.); and 244 cm (8 ft.) apart. This is consistent with the findings of the

Table 2
Means, Standard Deviations, H Value and
Probability for Each Category

Distance		Popular	Amiable	Isolated	Rejected	H	p<
Less than 30.5 cm Apart	\bar{X} SD	8.97 24.45	5.33 14.74	8.0 15.65	6.7 15.36	8.29	.04**
30.5 cm Apart	\bar{X} SD	24.92 54.00	22.78 40.11	25.65 55.40	39.73 70.53	4.34	.23
61 cm Apart	\bar{X} SD	12.48 18.94	25.0 40.14	19.11 30.67	24.25 43.58	2.05	.56
91.5 cm Apart	\bar{X} SD	18.42 28.74	22.56 34.01	17.55 40.96	18.06 25.09	3.05	.38
122 cm Apart	\bar{X} SD	6.12 10.45	8.56 18.89	10.40 18.22	16.26 42.62	4.13	.25
152.5 cm Apart	\bar{X} SD	.67 .97	20.08 42.73	6.33 10.21	2.75 5.95	17.75	.000**
183 cm Apart	\bar{X} SD	1.24 1.56	3.05 3.51	3.53 6.00	1.09 1.63	4.7	.19
213.5 cm Apart	\bar{X} SD	1.24 2.29	4.83 12.42	2.25 4.02	3.13 4.64	4.14	.25
244 cm Apart	\bar{X} SD	2.29 6.73	0.00 0.00	.21 .43	1.95 4.07	10.64	.01**
274.5 cm Apart	\bar{X} SD	.18 .39	1.00 2.76	.65 1.22	.63 2.25	1.89	.59
305 cm Apart	\bar{X} SD	.50 1.21	.43 1.16	16.11 34.68	2.35 6.12	3.0	.39
Both Children Off-Task	\bar{X} SD	18.54 40.61	17.00 31.33	13.27 18.23	29.07 67.57	1.52	.68
Target Alone Off-Task	\bar{X} SD	12.45 29.21	19.3 81.37	9.84 17.36	12.29 41.87	8.5	.04**

**Indicates Statistically Significant Results

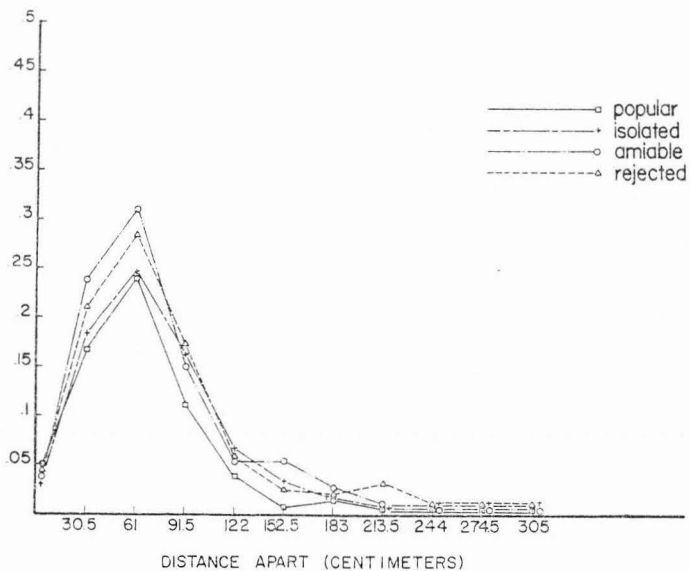


Figure 16. Mean proportion of transitions for each category.

frequency distributions previously presented and the results of the Kruskal-Wallis statistic.

What is very different about this distribution, in relation to those presented previously, is that there appears to be large movement discrepancies in the 213.5 to 305 cm (7 to 10 ft.) distances. The isolated children move to the 244 and 274.5 cm (9 and 10 ft.) distances) almost .01% of their total transitions, and moves to the 244 cm (9 ft.) distance make up .009% of the total transitions for the amiable children. This contrasts to the popular and rejected children who make only .004% of their transitions to these large distances. This finding is not consistent with the frequency distributions or with the Kruskal-Wallis statistic. Figure 16 indicates that the popular and rejected children seek interaction at the closer distances more often than the amiable and isolated children they thus make fewer moves away from their confederates to the greater distances.

Off-Task Behavior

When a child was not playing with the play dough and was 61 cm (2 ft.) or more away from the table, he or she was considered to be off-task. Figure 17 illustrates the mean proportion of total session time spent by each sociometric category off-task, while the non-identified child was still attending to the stimulus material. The popular children exhibited the greatest proportion of behavior in this zone, resulting in a mean proportion of total session time in this zone of .1%. This compares to the .05% for the amiable

children, .07% for the isolated children, and .03% for the rejected children.

The data presented in Figure 17 for the identified children off-task alone are interesting in comparison with the histograms illustrating the mean proportion of total session time spent off-task with the nonidentified child for each category. Once again, the popular children spent .1% of their time off-task with the other child, and the only category of children that did not increase the amount of time spent off-task alone in comparison with the time spent off-task with the nonidentified child. This is distinct from the other three groups of children; the amiable, isolated, and rejected children all increased in the amount of time spent off-task when with the confederate.

The Kruskal-Wallis statistic used to determine differences in the amount of time the nonidentified children spent off-task alone yielded nonsignificant results (see Table 3).

Table 3
Neutral Children:Off-Task Behavior Alone

Mean (Seconds)	3.99
Standard Deviation	6.781
"H" Value	2.63
Probability	0.45

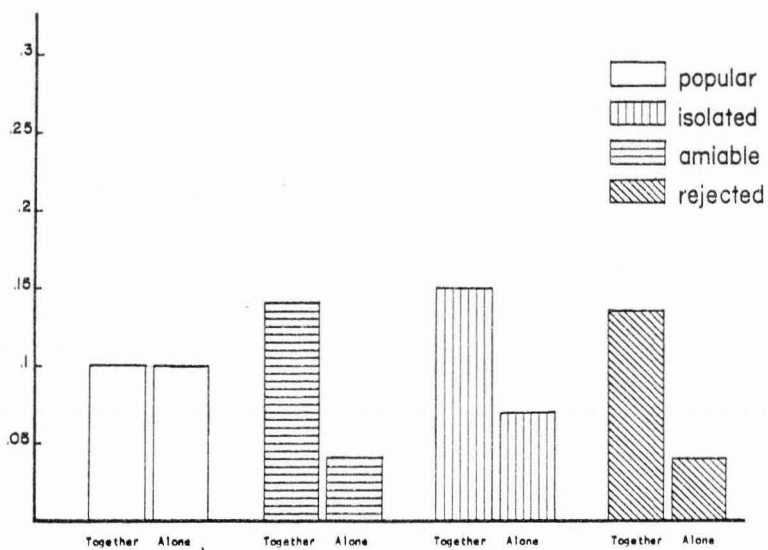


Figure 17. Mean percent of time spent off-task alone and with the confederate.

DISCUSSION

The data resulted in five major findings. First, a general pattern of proxemic behavior for preschool children was discovered, with the greatest percent of time being spent at close distances to other children of 0 to 122 cm (0 to 4 ft.). Very little time was spent at distances greater than 152.5 cm (5 ft.). Most of the children observed spent more short than long durations at distances of less than one foot from their confederates.

Second, statistically significant differences were found to exist between the four sociometric categories at the following distances; 0 to 30.5 cm (0 to 1 ft.); 152.5 cm (5 ft.); and 244 cm (8 ft.).

Third, when comparing the distributions of the mean proportion of time spent at each distance, differences in proxemic behavior between the four categories of children were found to exist, especially at the 0 to 30.5 cm (0 to 1 ft.) distance, the 152.5 cm (5 ft.) distance and the 244 cm (8 ft.) distance.

Fourth, the transitional behavior of the children at each distance, discriminated between the four sociometric categories of children at the following distances; 0 to 30.5 cm (0 to 1 ft.); 152.5 cm (5 ft.); 244 cm (8 ft.); 274.5 cm (9 ft.) and 305 cm (10 ft.). The differences between categories at the 274.5 cm and 305 cm (9 and 10 ft.) distances were inconsistent with the other findings but were hypothesis confirming, since the popular and rejected

children made less transitions to these large distances than the amiable or isolated children.

Fifth, statistically significant differences were found to exist when the children were off-task alone in the experimental situation with the popular children spending considerably more time in this zone than the other three categories of children.

Proxemic Behavior

Similarities across categories. The data suggest some overall proxemic behavior patterns for all children 3-5 to 5-0 years of age. The distributions representing the mean proportion of time at each distance (Figure 4), appear similar in basic shape. All four groups of children spent their greatest proportion of time at distance of 30.5 and 60 cm (1 and 2 ft.) from their confederates. At distances of 91.5 and 122 cm (3 and 4 ft.), all of the distributions decline at approximately the same rate. The mean proportions of time are low for all four groups at the 244 cm (8 ft.), 274.5 cm (9 ft.), 305 cm (10 ft.) distances, after stabilizing at the 152.5 cm (5 ft.), 183 cm (6 ft.), and 213.5 cm (7 ft.) distances.

The distributions for the mean proportion of transitions for each of the four categories also illustrate similar patterns of behavior, with the largest proportions of moves for all categories occurring at the 61 and 91.5 cm (2 and 3 ft.) distances. When compared with the normalized relative frequency distributions, there appears to be greater discrepancies in transition behavior in

the distances of 231.5 cm (7 ft.), 244 cm (8 ft.), 274.5 cm (9 ft.) and 305 cm (10 ft.) but the overall shape of all these distributions are skewed to the left indicating a larger proportion of interaction at the distances of 0 to 122 cm (0 to 4 ft.).

Hall (1966) conducted research with adults that resulted in the specification of four distinct personal zones: (a) Zone One consisted of a distance of 0 to 46 cm (0 to 1.5 ft.), which was reserved for very personal, intimate contacts; (b) Zone Two extended from 46 cm to 122 cm (1.5 to 4 ft.), and was used by adults for friendly contacts; (c) Zone Three encompassed the 122 cm to 366 cm (4 to 12 ft.) area around the individual and was maintained at times of business transactions and social engagements; (d) Zone Four was reserved for formal affairs, and extended 366 cm to 732 cm (12 to 24 ft.) from the individual.

In light of Hall's findings, overall proxemic patterns of the preschoolers observed in this study becomes very interesting. Previously, much ambiguity surrounded the concept of preschool children consistently utilizing personal space zones that were at all similar to those typically maintained by adults. The present data suggest that by the time a child is of preschool age, he or she has already developed, and is maintaining, personal space behavior that is indeed very close to that displayed by adults. Hall's second zone (friendly zone) that extended 46 cm to 122 cm (1.5 to 4 ft.) from the individual, was used by adults for friendly, personal, (but not intimate), contacts. This is consistent with the findings of this study. The majority of the children observed spent the

greatest amount of time in the 30.5 to 122 cm (1 to 4 ft.) distance, regardless of category. Hence, what Hall (1966) found to be true of adults' proxemic behavior appears to be shared by children of preschool age, in relation to the experimental condition: the children would be expected to feel "friendly" with the confederate in the observation room since the children had been together in the same preschool classroom for at least six weeks. Although some of these children may feel even more intimately close to their confederate, (as indicated by a substantial amount of time spent by some of the subjects, at less than 30.5 cm (1 ft.), most children related to their confederates on a friendly basis and thus maintained a distance of 30 to 122 cm (1 to 4 ft.) from them.

The popular children spent twice as much time at the 0 to 30.5 cm (0 to 1 ft.) distance than the other three categories of children. In light of Hall's theory of proxemics (1966), it is possible that the popular children desire a closer personal space "bubble" than the other three sociometric categories which resulted in more interaction in the 0 to 30.5 cm distance. These data might also be interpreted in terms of the sociometric ratings received by the popular children. The fact that the popular children were rated by their peers as being well liked might indicate that they related more intimately with a greater proportion of the children in the classroom. Hence, more behavior would be exhibited in the zone that Hall referred to as the intimate distance (0 to 30.5 cm or 0 to 1 ft.)

In summary, the intimate and personal zones of personal space maintenance set forth by Hall in 1966, in relation to adult proxemic behavior, may very possibly apply to children as young as 3 to 5 years of age, as indicated by these data. All of the subjects, regardless of sociometric category, spent the greatest proportion of time 30.5 to 122 cm, (1 to 4 ft.), from their confederates, which corresponds with Hall's personal zone (#2), reserved by adults for use in friendly situations.

Differences between sociometric categories. Popular children exhibited by far the most behavior of the four categories of children at a distance of 30.5 cm (1 ft.) from their peers. These children spent 48% of their total session time at this distance, and 40% of their time at the 61 and 91.5 cm (2 and 3 ft.) distances. These distances are considered close proximities of interaction within the friendly personal space zone as designated by Hall (1966).

Although popular children did not spend proportionately large amounts of time (7%) at a distance of less than 30 cm (1 ft.) from their confederates, they did exhibit the greatest amount of behavior at this distance, spending almost twice as much time here as the other three categories of children.

The popular children spent very little time more than 91.5 cm (3 ft.) from the other children. Only .05% of their total session time was spent at a distance of 122 cm (4 ft.) from their peers with the percentage of time spent at greater distances steadily decreasing. The original prediction that the popular children would spend the

largest proportion of their total session time in close proximity to their peers and would avoid spending much time at far distances from their confederates was substantiated.

The findings related to popular children are consistent with the high social impact scores received by this category. Since they spent 88% of their total session time at distances less than 91.5 cm (3 ft.), they would obviously receive high visibility (impact) scores from their peers. The positive social preference scores received by the popular children may possibly be a result of their high social impact. All children, regardless of category spent the highest proportion of time 61 to 122 cm (1 to 4 ft.) from their confederates. The fact that the popular children sought out these close distances frequently, may contribute to their high social preference scores.

Amiable children spent the largest percentage of their total time (33%) in the 30.5 cm (1 ft.) distance, as did the popular children, but this percent is much lower than that of the popular children. Amiable children also spent almost the same amount of time at the 61 cm as they did at the 30.5 distance, (34% and 33% respectively). This is a dramatic contrast to the popular children's time, who spent almost half again as much of their total time at the 30.5 cm (1 ft.) distance and only 25% of their time at the 61 cm (2 ft.) distance. It appears that the amiable children seek out an interactional distance that is approximately 30.5 cm (1 ft.) further apart from their peers than the interactional distance most sought by the popular children.

The amiable children had more interaction of longer durations in the distances larger than 122 cm (4 ft.) than the popular children. This was dramatically demonstrated at the 152.5 cm (5 ft.) distance in which the amiable children spent 12% of their time, the greatest proportion of time at this distance for all four categories. The next highest percent of activity at 152.5 cm was demonstrated by the isolated children who spent only 3% of their total time at this distance from their confederates. This indicates a much greater tendency by amiable children, than the other three categories, to seek out this large interactional distance. Hall (1966) included this 152.5 (5 ft.) distance in the social zone which was used by adults for business and general social, (but not friendly) interactions. This suggests that amiable children may relate less intimately than the popular children to many of their peers.

Amiable children receive low social impact scores, (low visibility), and yet also receive positive social preference scores, indicating that these children do interact well with others. Perhaps part of this positive social preference score is due to the ability of amiable children to interact at a greater variety of distances, [they exhibited 66% of their behavior at the 61 to 213 cm (2 to 7 ft.) distances], than the other sociometrically identified children, thus increasing their compatibility.

Isolated children demonstrated the greatest percentage of their total activity at the 61 cm (2 ft.) distance. This represents a 30.5 cm (1 ft.) personal space increase over the popular children who spent their greatest amount of time at the 0 to 30.5 cm distance.

The isolated children behaved very similarly to the rejected and amiable children at the 30.5 cm distances but demonstrated a great deal more behavior at the 61 cm distance than the other four categories of children. The distribution (Figure 4), for the isolated children drops dramatically after the 61 cm distance and then remains fairly stable through the remaining distances. The isolated children also spent almost twice as much time when 305 cm (10 ft.) from their peers than the amiable children and almost three times more than the popular children when 305 cm from their confederates. It was predicted that the isolated children would feel more comfortable at the greater distances than the other children and this was confirmed. The isolated group was the only one of the four categories of children that did not spend the greatest proportion of time at the 30.5 cm distance, but apparently preferred more interaction at the 61 cm distance. They also spent longer durations, and more time at the larger distances than the other three categories, which was also consistent with the original expectations.

Isolated children receive low social impact ratings from their peers which corresponds with the greater personal space "bubble" of these children (30.5 cm greater than that of the other three categories). The negative social preference scores received by the isolated children suggest that their peers do not seek interaction with them frequently. This may be due to the larger than average personal space distance maintained by isolated children, and the presence of nonverbal communication to their peers that they do not desire close interactional distances.

Rejected children spent the greatest proportion of their total session time at the 30.5 distance as did the popular and amiable children. However, the percent of time spent by the rejected children at this distance (32%) is much lower than the percent of time spent by the popular children (48%), when 30.5 cm from their peers, and is very close to the amount of time the amiable children spent at the 30.5 cm distance (33%).

The rejected children maintain the highest proportion of activity at the 244 cm (8 ft.) distance for all four categories, (three times as much activity as the isolated and almost twice as much activity as the popular children displayed at this same distance), and also exhibited the greatest amount of activity at the 274.5 and 305 (9 and 10 ft.) distances.

It was predicted that the rejected children would try to interact at the closer distances, producing high social impact scores, but would be unable to maintain the close proximity to their confederates, reflecting the negative social preferences scores received by the rejected children. Examination of the mean proportion of time spent at each distance indicates that this prediction was partially substantiated. The amount of time spent at the 30.5 distance by the rejected children is not higher than the proportion of time spent at this distance by the amiable and isolated children. This was not predicted. It was expected that the rejected children would spend a higher percent of time at close distances similar to the mean proportion of time spent in close

proximity by the popular children. However, it is possible that the rejected children made attempts to move in closer, thus producing the high social impact scores, but were "rejected" by their peers, which would account for the lower proportion of time spent at the 30.5 cm distance, than that spent by the rejected children at the 244 cm, 274.5 cm and 305 cm (8, 9, and 10 ft.) distances. The other children simply may not want to be in close proximity to the rejected children.

In summary, the popular children spent the largest proportion of total time at distances of 0 to 91.5 cm (0 to 3 ft.) from their peers and displayed very little behavior at distances greater than 122 cm (4 ft.). The amiable children exhibited equal amounts of activity at the 30.5 cm and 61 cm (1 and 2 ft.) distance, and demonstrated a substantial amount of behavior at distances of 91.5 cm (3 ft.) and 213 cm (7 ft.) distances. The amiable children spent the greatest proportion of time for all four categories at the 152.5 cm (5 ft.) distance but displayed very little activity at distances greater than 213 cm (7 ft.). The isolated children spent the greatest amount of their time at the 61 to 274.5 cm (2 to 9 ft.) distances. They also exhibited the second largest proportion of behavior in the 274.5 and 305 (9 and 10 ft.) distances. Finally, the rejected children spent most of their time at the 30.5 to 91.5 cm distances, but also exhibited the greatest percentage, of the four categories, at the 244 cm, 274.5 cm and 305 cm (8, 9, and 10 ft.) distances. indicating that a substantial amount of the rejected children's

time was spent at the greater distances from their peers, compared to the other three categories of children. The popular children spent by far the greatest proportion of time for all four sociometric categories at the closest distances. These findings were consistent with the predicted results.

Off-Task Behavior

In the analysis of the off-task behavior, all four categories produced different data further indicating that the sociometric measure did produce four distinct categories of children. The popular children displayed the greatest variance in behavior of all four categories: these children exhibited the only constant proportion of activity between the two off-task situations (alone and with the confederate).

The behavior of the popular children in the off-task situations may be interpreted in relation to personality characteristics possessed by these children. It may be that the popular children possess a stronger resistance trait than other children causing them to be less susceptible to the influence of other individuals, particularly their peers. The consistent percentage of time spent in the two off-task situations may also be a reflection of the popular children's lack of compliance to the instructions given by the experimenter to play with the play dough. Although this is pure conjecture, it is possible that the popular children are naturally less compliant and therefore, respond more independently of others regardless of the situation. Other personality traits or

characteristics, including increased confidence, may account for the difference in the off-task behavior of the popular children. This hypothetical personality variable may explain not only differences found in the proxemic behavior of the popular children but may also account for the popular sociometric ratings that these children consistently receive from their peers.

Statistical Versus Functional-Phenomenological Significance

The research addressed itself to two basic questions: was there a meaningful relationship between sociometric status and proxemic behavior and does the sociometric measure, which has been shown to discriminate meaningfully on measures of social comprehension, also identify groups which differ on proxemics and personal space?

Evaluation of statistically significant results does not fully answer these questions. It is difficult to know what is psychologically important by attending only to "H" values and probability statements. While the differences among the four sociometric groups showed statistically significant differences in four situations, the functional-phenomenological differences that resulted are as important and interesting in understanding the implications of this data. Hence, the important aspect of this study is its explanatory power. The research looked at children of different sociometric categories, trying to detect differences in proxemic and personal space behavior. The Kruskal-Wallis tests indicated some

statistically significant differences; functional-phenomenological differences allow one to interpret the meanings of those differences.

Although statistically significant results were not found at the distance of 305 cm (10 ft.) examination of Table 2 shows that the isolated children had a mean of 16.11 seconds at this distance. This compares with a mean time of .5 seconds for the popular children, .43 seconds for the amiable and 2.35 seconds for the rejected children. This indicates an interesting trend. The isolated children were expected to spend a substantially greater proportion of time at this far distance, which was substantiated in the observed behavior of the isolated children in the experimental situation and indicated by the mean time of these isolated children at 305 cm (10 ft.). This substantially greater time spent by isolated children at this large distance accounts for the low social impact scores received by this group and may even affect the low social preference scores of the isolated children. Interaction at 305 cm (10 ft.) is probably uncomfortable for most peers of these isolated children and not sought by many.

Review of the data presented in Table 2 for the time the children spent off-task with the confederate, also indicates a second trend of interest. Although this zone did not produce statistically significant results, there appears some large categorical discrepancies in behavior. The rejected children had a mean time of 29.07 seconds compared to 18.54 second for the popular children, 17.0 seconds for the amiable, and 13.27 seconds for the isolated children

when off-task with the nonidentified child. These data suggest that the rejected children joined the confederate in the off-task behavior in an attempt to maintain close proximity and interaction or that the rejected children attracted the other child away from the play dough to the off-task zone. The latter is somewhat doubtful in light of the negative social preference scores received by the rejected children indicating that the peers of these children do not frequently desire or seek their company.

Overall, the mean times spent at each distance by the four categories, (Table 2), indicate trends in the direction originally predicted. The popular children had the largest mean times at the close distances (0 to 91 cm), corresponding to the high social impact scores received by these children. The isolated and amiable children consistently maintained high mean times at the intermediate and large distances (122 to 305 cm), accounting for the lower social impact score received by these children.

Conclusions

Several conclusions can be drawn as a result of this study.

The preschool age subjects utilized in this study demonstrated general patterns of proxemic behavior, regardless of sociometric status. These subjects spent the majority of their total session time at close distances of 30 to 122 cm from their peers and spent a very low percentage of time at distances greater than this. The implications of this finding are twofold: first, it is highly possible, as indicated by these data, that preschool children have

developed proxemic behavior that includes personal space maintenance, and that this behavior is fairly stable for all children of this age. Second, the personal space behavior of these children very closely approximates that of the adults studied by Hall (1966), indicating that proxemic behavior of preschool children remains stable throughout their lifetime.

One of the questions addressed by this research concerns whether the sociometric measure would identify groups which differ in their proxemic behavior. The results of the current study indicate that the sociometric ratings were meaningful and did describe four different categories of children who differed in their personal space behavior. Statistically significant differences were found in the proxemic behavior of the children when less than 30.5 cm (1 ft.), from the other children, and when 152.5 and 244 cm (5 and 8 ft.) from the confederates. Statistically significant differences were also found when the children were off-task. The differences in the proxemic behavior between sociometric categories indicates that the sociometric status of children may directly relate to the personal space maintenance of preschool children.

Summary

Definite differences in the proxemic behavior of the four sociometric categories of children were found. The popular, amiable, isolated, and rejected children all displayed unique activity in seven of the ten distances and in the off-task situation. This substantiates the sociometric categories conceptualized by Peery

(1979) and the data of Bakken (Note 2), and suggests that preschool age children have developed, and are operating within, distinct personal space zones very similar to those created and maintained by adults (Hall, 1966). These data also indicate that the proxemic behavior of children, although similar across categories, is maintained differently as a function of sociometric status.

Implications for Further Study

This study answered some important questions. However, it also led to more questions that need to be explored in further study.

Due to the static nature of this data analysis it is difficult to predict why the children proportioned their time in the various distances as they did. It will be necessary to build transition matrices for the four groups across distances to understand the true nature of these data. It is impossible to know why a child moved in or out of a particular distance without knowing who moved first, the target child or the nonidentified child. This type of analysis (transition matrices) will reveal whether a move by the target child into a specific distance was the result of trying to maintain a more proximate distance to, or greater distances from, the confederate.

The physical setting of the observation room resulted in an unexpected limitation of the interpretation of the results of this study. Because of the size of the experimental room the children were able to move away from the table, and the other child, into the off-task area to assume a greater distance from the confederate. This was confounding to the extent that it was impossible to

determine if the child was moving away from the table because he or she did not want to play with the play dough or because he or she wanted to move away from the other child. It was also impossible for the children to move off-task to join the other children already off-task. This situation raises the same question: was the child drawn to his or her peer who was already off-task or was the child simply tired of playing at the table and thus seeking new stimulation?

Most importantly, a replication of the study of proxemic behavior of the young child is needed. The personal space maintenance of preschool children has been studied only slightly and this research represents one of the first attempts to explore the proxemic world of the young child. The results of this study offer some interesting and important inferences that demand exploration. It will be necessary to investigate the findings of this study in greater depth and through replication studies, to fully understand the nonverbal processes involved in the proxemic behavior of young children. Different combinations and manipulation of the variables involved in this research would also be meaningful.

This study focused on the personal space behavior of the young child, which represents only one small area of nonverbal communication and yet at the same time encompasses many types of this powerful behavior. From the present study, it is apparent that the issue of nonverbal communication is complex, and is highly intertwined with the verbal communication process. Without continued, carefully engineered research in this domain, conducted with young subjects, it will be impossible to fully understand the realm of human behavior.

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VITAE

Laura Gaynard

Candidate for the Degree of

Master of Science

Thesis: Proxemic Behavior of Sociometrically Identified Preschool Children

Major Field: Family and Human Development

Biographical Information:

Personal Data: Born in Exeter, California, January 24, 1953.

Educational History: Graduated from Tulare Union High School, 1971, Tulare, California. Received Bachelor of Science Degree from San Diego State University, 1977; Major in Child Development and Family Relations.

Professional History: Preschool teaching experience, 1972-1977, Newport Beach, California, and San Diego, California in a variety of settings, Research Assistant at USU 1977-1979; involved collection of data for study of musical preference and their origins of preschoolers, and testing of pre-school children for the Western Regional Project on the development of social competency. Coordinator of graduate student assistants, 1978-1979. Designed and conducted research exploring parental perceptions of neonate as a function of their activity level and gender, 1977-1978. Administrative Assistant for the Institute for the Study of Interdisciplinary Law, 1980. Educational Director for Planned Parenthood of Utah, 1980. Instructor for Department of Family and Human Development at USU, 1980.

Publications:

Gaynard, L. L., Creative Movement and Young Children. Head Start Preschool Program, October, 1977, Millville, Utah.

Gaynard, L. L., Science Curriculum in the Preschool Classroom. Head Start Preschool Program, November, 1977, Millville, Utah.

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Jensen, L., Adams, G., Peery, C., Gaynard, L. Maternal Behavior and the development of empathy in preschool children. Paper presented at the Rocky Mountain Psychology Association, Tucson, Arizona, 1980.

Professional Organizations: Phi Kappa Phi, Phi Upsilon Omicron, Utah Association for the Education of Young Children, National Council of Family Relations, Society for Research in Child Development.

UTAH STATE UNIVERSITY
DEPARTMENT OF FAMILY & HUMAN DEVELOPMENT
UMC 29
LOGAN, UTAH 84322